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TECHNICAL SUPPORT FOR THE TAPE RECORDING/REPRODUCING GROUP.(U)
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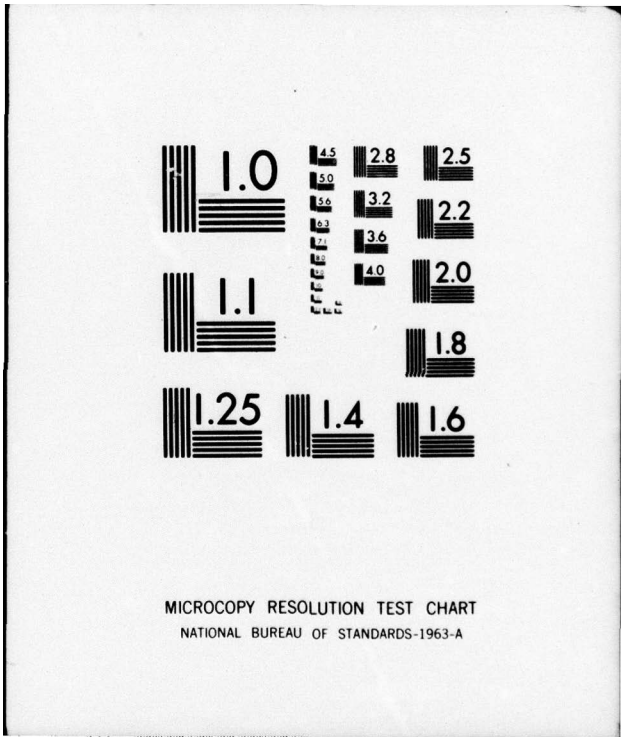
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FINAL REPORT

TECHNICAL SUPPORT FOR THE

TAPE RECORDING/REPRODUCING GROUP

by

Dr. Bernard Harris

Submitted under Contract No. N62269-77-M-8337

Prepared for:

Naval Air Development Center
Warminster, Pa 18974

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High density digital recording

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The purpose of this effort was to investigate immediate solutions and address the problems of the real data handling in the ASW community based on utilizing magnetic tape recording/reproducing systems.

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1.0 Work Performed

The purpose of this effort was to investigate immediate solutions and address the problems of the real data handling in the ASW community based on utilizing magnetic tape recording/reproducing systems. Two tasks were done under this effort. The results obtained are summarized in Section 2.0.

2.0 Results

2.1 Task I: High Density Digital Recording/Reproducing Standards

Basic limitations of high density digital recording were examined to identify and assist in the search for the best technique. In this regard, an investigation was made on the spectral density of digital magnetic tape codes and reported on in Technical Report, TR 76-324, "Spectral Densities of Digital Magnetic Tape Codes."

The comparison between different codes for magnetic tape recording purposes was made by comparing the spectral densities of the corresponding waveforms which result when a sequence of random binary digits is encoded. Such a comparison is helpful in relating the spectrum of the code to the transfer function and noise floor of the tape recorder to assure that a match is present. While it is a good overall way of examining codes, and much of the literature makes much of this spectral density, it is not a definite measure of effectiveness of the code because there are other factors such as d-c content, noise immunity, and complexity which can be equally important.

Selection of the best high density digital coding scheme for Navy purposes is clearly a multi-faceted task. The development of standards to prevent a myriad of incompatible systems from entering the Navy inventory is a complex but essential task.

2.2 Task II: Degaussing Needs

The need to degauss magnetic tape heads was considered in detail. The details of this examination are reported on in Technical Report TR 76-313, "Magnetic Heads in Tape Recording Systems; Field Strengths and Degaussing Needs." The support material for this examination is reported on in Technical Reports TR 76-314, 315, and 317.

An evaluation was made of the magnetic flux densities in the recording and reproduce headsof low band, intermediate band, and wideband magnetic tape systems. This evaluation was made for the recording process and reproduce process as well as the extent of the residual fields due to accidental magnetization of the heads.

The most critical degaussing need is the residual field of the reproduce head in wideband systems. In this case, lack of degaussing can cause a loss of the higher recorded frequencies. There is a smaller need to degauss the recording head to avoid increases in the system noise level.

3.0 Recommendations

1. The need to standardize high density digital recording systems for ASW purposes will be difficult to satisfy. However, it is extremely timely to address the problem now before many incompatible systems enter the Navy inventory.

2. Head degaussers are required for wideband magnetic tape systems.